

~~Claims~~

*a*  
*What is claimed is*

- Sub a1*
1. A broadband driver for signals that are transmitted in different frequency ranges, comprising:
    - (a) a first broadband driver circuit (19) for driving first signals having signal frequencies that lie in a first frequency range;
    - (b) a second broadband driver circuit (24) for driving second signals having signal frequencies that lie in a second frequency range;
    - (c) where at least one of the two broadband driver circuits (19) has a frequency-dependent positive-feedback circuit (44) for impedance synthesis of a frequency-dependent output impedance ( $Z_{out}$ ) of the broadband driver circuit (19), and where the output impedance ( $Z_{out}$ ) has a different value in the first frequency range than in the second frequency range.
  2. The broadband driver as claimed in claim 1, wherein the first broadband driver circuit (19) is designed to drive audio frequency voice signals, audio frequency ringing signals and DC signals.
  3. The broadband driver as claimed in claim 1 or 2, wherein the second broadband driver circuit (24) is designed to drive radio frequency data signals.
  4. The broadband driver as claimed in one of the preceding claims, wherein the first broadband driver circuit (19) has a signal preamplifier circuit (60) connected to its input.

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5. The broadband driver as claimed in one of the preceding claims, wherein the positive-feedback circuit (44) feeds a signal output (20) of the first broadband driver circuit (19) to a signal input of the first broadband driver circuit (19).
6. The broadband driver as claimed in claim 4, wherein the positive-feedback circuit (44) feeds the signal output (20) of the first broadband driver circuit (19) to a signal input of the signal preamplifier circuit (60).
7. The broadband driver as claimed in one of the preceding claims, wherein the positive-feedback circuit (44) has a complex impedance.
8. The broadband driver as claimed in one of the preceding claims, wherein the positive-feedback circuit (44) contains a capacitor.
9. The broadband driver as claimed in one of the preceding claims, wherein the complex impedance of the positive-feedback circuit (44) decreases as the signal frequency increases.
10. The broadband driver as claimed in one of the preceding claims, wherein the broadband driver circuits (19, 24) have a fully differential design.

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11. The broadband driver as claimed in one of the preceding claims 4 to 10, wherein the signal preamplifier circuit (60) has a fully differential design.
12. The broadband driver as claimed in one of the preceding claims, wherein the signal outputs (20, 27) of the two broadband driver circuits (19, 24) are connected in parallel and are connected to a transmission channel (13) via a signal output (12) of the broadband driver (1).
13. The broadband driver as claimed in claim 12, wherein the transmission channel (13) is a two-wire telephone line.
14. The broadband driver as claimed in one of the preceding claims, wherein the signal output of the second broadband driver circuit (24) is connected to a transformer circuit (81).
15. The broadband driver as claimed in one of the preceding claims 3 to 14, wherein the radio frequency data signal is an xDSL signal.
16. The broadband driver as claimed in claim 15, wherein the radio frequency data signal is an ADSL data signal.